UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II

DATE: MAY 19 2003

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REMOVAL ACTION BR.

SUBJECT: Review of the March 28, 2003 Draft Remedial Investigation Workplan for the Bayonne Barrel and Drum Site, Newark, NJ

FROM: Ray Klimcsak, Environmental Scientist
Hazardous Waste Support Section (2DESA-HWSB)

TO: Joseph Cosentino, On-Scene Coordinator
Removal Section (2ERRD-RAB)

As per your request, I have reviewed the March 28, 2003 Draft Remedial Investigation Workplan, which includes the Workplan and Quality Assurance Project Plan (QAPP), for the Bayonne Barrel and Drum Site, located in Newark, New Jersey. All Plans were prepared by Quest Environmental and Engineering Services, Inc. for the PRP Group and *de maximis*, Inc. My comments are attached.

If you have any questions or require further information, please contact me at (732) 906-6875.

Attachments

cc: Robert Runyon, 2DESA-HWSB
Richard Salkie, 2ERRD-RAB

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Draft Workplan and QAPP
Remedial Investigation Activities
Bayonne Barrel and Drum Site (Newark, New Jersey)

General Comment

1. Neither of the Plans were signed by a Quality Assurance Officer (QAO), indicating that an internal quality assurance review of this document had not been performed prior to submitting these documents to the EPA. The lack of an internal review is evident due to the fact that the incorrect Appendices have been referenced in both the Work Plan (Appendix F and G) and the QAPP (i.e., Section B.2) as well as other technical deficiencies. This is most likely an indication that a previously completed plan had been used as a template to create these Plans. It should be noted that an internal quality assurance review process is an essential step to ensure that quality data will be generated to meet the needs of the project. In addition, the names, titles, signatures of appropriate approving officials and their approval dates must be included with the Plans.

2. The Data Quality Objectives presented in the QAPP are inadequate. Specifically, sufficient detail regarding the data quality indicators and their associated measurement performance criteria was not present for the proposed screening method (i.e., CALUX) This includes, but is not limited to the criteria used for the selecting 10 % as the number of confirmatory samples to be collected, the specific performance evaluation criteria (i.e., what is the "allowable" percent difference between the results of the screening samples and the confirmatory samples to be considered successful) used to compare the two data sets, and the corrective actions to be employed if a non-compliance is encountered (i.e., if the results of the screening samples do not correlate to the confirmatory samples, will additional confirmatory samples be collected?).

   This information must be defined and presented in this QAPP to verify that the screening data and proposed limited confirmatory (definitive) data is of the appropriate quality to support the decisions being made. It should be noted that there is presently an EPA SW-846 screening method available for the screening of Polychlorinated Dibenzodioxins and Polychlorinated Dibenzofurans (PCDD/Fs) by Immunoassay (i.e., SW-846 Method 4025). More information on this methodology is available at: http://www.epa.gov/epaoswer/hazwaste/test/pdfs/4025.pdf. However, prior to the selection of a new method, an assessment must be performed to determine whether the specific analytes of interest will be detected at the levels of interest.

3. Groundwater results collected from Monitoring Well #2614909-5 have indicated detectable levels of contaminants (VOCs, metals, pesticides, and PCBs) above the NJ Non-Residential Direct Contact Soil Cleanup Criteria (NRDCSCC). Because this well is located along the boundary of the site (east, southeast portion of the site), information must be provided as to the efforts which may be taken beyond the property boundary.

Specific Work Plan Comments

1. Section 1.2.1 Sampling Objectives, page 1-3 - A table which indicates the associated action levels for soil (in this case NJ Soil Cleanup Criteria and the NJ Non-Residential Direct Contact Soil Cleanup Criteria) and groundwater (NJ Class II-A Ground Water Quality Standards), the analytical method, and the analytical reporting limit for each contaminant of concern should be presented. This will ensure that the appropriate analytical methods have been selected for the analyses of all matrices and that the data produced will meet the sensitivity needs of the project.

2. Section 1.2.2 Data Quality Objectives, page 1-3 - See General Comment # 2 above. In addition, it is stated that reporting levels for the analytes of interest are summarized in Table 1; however, they are not. As previously mentioned a table should be created which presents the analytical method, along with the reporting limit and the action levels.

3. Section 1.3 Project Organization, page 1-4 - The personnel (i.e., staff from *de maximis* or Quest) that will perform data validation for this project must be identified and their qualifications presented.

4. Section 3.1 General Sampling Approach and Rationale

a. Page 3-1 - It is stated that in-situ treatment of soil containing VOCs greater than NJ NRDCSCC will occur. However, the specifics of what in-situ treatment will entail should be provided.

b. Page 3-2 - The factor of six (6) which has been selected as the conservative value to base sampling decisions, must be agreed upon by all regulatory parties.

5. Section 3.2.1 Yard Area, page 3-4 - It is stated that the sampling depth interval for the analysis of TPHs, Semi-VOCs, Pesticides, and Metals will be 0-6 inches. However, depending on the auger used, limited volume may be recovered. If the top six (6) inches of soil is critical and the resultant data must be used by the EPA Risk Assessors in determining possible exposures, then it must be assured that sufficient volume from this defined area be collected.

6. Section 3.2.2 Furnace Courtyard, page 3-5 -

a. It is stated that VOC impacted soils may undergo treatment; however, the specific "treatment" referred to in this section should be clarified.

b. It is anticipated that samples will be collected for TPH analysis at several different areas. Please clarify whether or not they will be sampled in the Furnace Courtyard area.

c. It is stated that four initial samples surrounding a "hot spot" sample is planned for horizontal delineation; however, the specific size of the area surrounding the hot spot area should be identified (i.e., 5 ft., 10 ft., etc.). In addition, the criteria to be used in selecting the four (4) surrounding locations should be presented.

7. Section 3.2.3 Storage Tank Area, page 3-7

a. Please expand on the extent to which horizontal and vertical sampling may be conducted if sample results for BBD-C3 and BBD-16 indicate elevated PCB levels.

b. Please provide a description of the "sediment" type which is being sought in the former surface impoundment area. In addition, please provide a description of how soil from this area will be differentiated from the sediment being sought. In addition, is percent (%) moisture a factor/concern?

c. Please clarify the reason as to why samples for VOCs will not be collected in the Perimeter Sampling area.

d. It is stated that eight (8) soil borings will be collected on each side of the USTs; however, the figures provided indicate that eight (8) soil samples will be collected in total at each UST. Please clarify the number of soil samples to be collected and ensure that this number is presented consistently throughout the Plans.

8. Section 3.2.4 Buildings, page 3-8 - Please provide a more detailed description of the extent to which samples will be collected horizontally and vertically in the "Hot Spot" Delineation Sampling area.

9. Section 3.2.5 Groundwater, page 3-9 - It is stated that a low-flow sampling method will be utilized for the collection of groundwater samples, specifically for metals analysis. However, the USEPA Region 2, Low-Flow Groundwater Sampling SOP, dated March 1998 (Attachment #1), was specifically designed for the collection of samples for VOCs, as well as all other samples. The reason as why the Low-Flow method would only be utilized for the collection of metals is unclear. It is highly recommended that the EPA Low-Flow Groundwater Sampling SOP be utilized for both the purging and sampling of groundwater monitoring wells for all parameters.

10. Section 3.3.1 Soil Sampling, page 3-10 - It is stated that soil samples for VOCs will be collected and preserved in the field utilizing methanol. It is recognized that this is a NJDEP recommendation. However, it should be noted that when samples are preserved with methanol, they are typically only able to be analyzed for medium to high concentrations (i.e., concentrations greater than 200 ppb). When soil samples are collected with the use of the EnCore™ sampler (or similar type sampler), 3 individual samples are collected enabling the lab to determine the concentration with one sample and the subsequent decision can be made to either preserve the samples with sodium

bisulfate (permitting low-concentration analysis, less than 200 ppb) or with methanol (permitting medium to high concentration analysis, greater than 200 ppb). It is therefore recommended that the EnCore™ sampler (or similar type sampler) be used for the collection of soil samples being analyzed for VOCs. For additional information concerning the EnCore sampler please see Attachment #2, especially noting the holding time requirements.

11. Section 3.3.3 Monitoring Well Sampling, page 3-11 - It is stated that Low Flow sampling will be conducted first, followed by conventional purge and sampling immediately after. See Specific Work Plan Comment #9 above. The USEPA Low-Flow Sampling procedure, dated March 1998 should be used for all purging and sampling activities for all parameters.

12. Section 4.6 Quality Control Samples, page 4-3

a. Concerning the collection of trip blanks consisting of methanol (for soil samples being collected for VOC analysis), please see Specific Work Plan Comment #10 regarding the recommendation for the collection of soil samples via the EnCore™, or similar type sampler.

b. Please clarify whether trip blanks will be collected for all aqueous samples, or only for those samples undergoing VOC analysis. Regional requirements define this trip blank as applicable to VOCs only.

c. Region 2 requires use of temperature blanks in coolers to verify that the samples have been maintained at 4°C. The temperature blank should consist of a sample container filled with nonpreserved water (potable or distilled) and included in each cooler containing samples (soil and aqueous) being sent for analysis. The container should be labeled "USEPA COOLER TEMPERATURE INDICATOR" and dated. Temperature of the blank should be taken and recorded on the chain of custody record immediately upon receipt at the laboratory, prior to inventory and refrigeration.

13. Table 1 (Data Quality Objectives)

a. A table for water samples should be included as well.

b. The term "reporting levels"is typically used by laboratories to specify the concentration(s) at which they can "confidently" report an analyte, typically 2-10 times the method detection limit (MDL). As a result, it may be better to change the column heading to "Data Deliverables".

14. Table 2 (Work Plan Schedule) - According to this table, data validation will not be performed until the very end of all work out in the field. It is highly recommended that data validation be performed on the data, as it is received from the laboratory. This will

enable additional samples to be collected in the field (while contractors are still mobilized in the field) if corrective actions (such as the need to collect additional samples) are necessary. Validation of sample results must occur prior to determining final delineation sampling locations. Validated data should be used in the results evaluation steps presented in Table 2.

15. Table 6 (Monitoring Well Samples) - Regarding the use of conventional purging and bailer use, please see Specific Work Plan Comment #9 above.

16. Table 8 (Sample Containers, Preservation, and Holding Times) - Concerning the sampling containers for soil samples for VOCs, please see Specific Work Plan Comment #10.

17. Table 8 - The footnote specifies that USEPA SW-846 3rd ed. 1995 was used for the citation of analytical methods. It should be noted that numerous updates have been made to SW-846 methodologies and can be viewed at the following Webpage: http://www.epa.gov/epaoswer/hazwaste/test/sw846.htm. In addition, the most recent methodology should be cited within this table (i.e., SW-846 8260B, not 8260).

Specfic QAPP Comments

1. Section A.1.4 Analytical Laboratory, page 7 - Although the name of the laboratory has been provided in the Work Plan, this information should be provided in the QAPP as well. In addition, the laboratory's quality assurance plan (LQAP) should be submitted for review. The laboratory should also submit current copies (within the past six months) of laboratory certification provided from either a State or Federal Agency which conducts certification. The certification should be applicable to the matrix/analyses which are to be conducted. If the laboratory does not participate in the Contract Laboratory Program (CLP), they must submit the results of performance evaluation (PE) samples for the constituents of concern from within the past six months or they must complete PEs for the matrixes and analyses to be conducted and results must be submitted in the LQAP.

2. Section A.3.1 Data Quality Objectives, page 10 - Concerning discussion on DQOs, see General Comment #2 above. Specific information regarding the use of the screening methodology and confirmatory sampling must be provided.

3. Section A.3.2 Data Quality Criteria -

a. (Page 13) - In the discussion provided for "Comparability", split sampling data is cited. However, specifics regarding the type of split samping performed and the methodology used to assess and evaluate the results were not. This information should be provided in the QAPP.

b. (Page 14) - The "established QC criteria" referred to in this section must be provided.

U.S. ENVIRONMENTAL PROTECTION AGENCY
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GROUND WATER SAMPLING PROCEDURE
LOW STRESS (Low Flow) PURGING AND SAMPLING

I. SCOPE & APPLICATION

This Low Stress (or Low-Flow) Purging and Sampling Procedure is the EPA Region II standard method for collecting low stress (low flow) ground water samples from monitoring wells. Low stress Purging and Sampling results in collection of ground water samples from monitoring wells that are representative of ground water conditions in the geological formation. This is accomplished by minimizing stress on the geological formation and minimizing disturbance of sediment that has collected in the well. The procedure applies to monitoring wells that have an inner casing with a diameter of 2.0 inches or greater, and maximum screened intervals of ten feet unless multiple intervals are sampled. The procedure is appropriate for collection of ground water samples that will be analyzed for volatile and semi-volatile organic compounds (VOCs and SVOCs), pesticides, polychlorinated biphenyls (PCBs), metals, and microbiological and other contaminants in association with all EPA programs.

This procedure does not address the collection of light or dense non-aqueous phase liquids (LNAPL or DNAPL) samples, and should be used for aqueous samples only. For sampling NAPLs, the reader is referred to the following EPA publications: DNAPL Site Evaluation (Cohen & Mercer, 1993) and the RCRA Ground-Water Monitoring: Draft Technical Guidance (EPA/530-R-93-001), and references therein.

II. METHOD SUMMARY

The purpose of the low stress purging and sampling procedure is to collect ground water samples from monitoring wells that are representative of ground water conditions in the geological formation. This is accomplished by setting the intake velocity of the sampling pump to a flow rate that limits drawdown inside the well casing.

Sampling at the prescribed (low) flow rate has three primary benefits. First, it minimizes disturbance of sediment in the bottom of the well, thereby producing a sample with low turbidity (i.e., low concentration

of suspended particles). Typically, this saves time and analytical costs by eliminating the need for collecting and analyzing an additional filtered sample from the same well. Second, this procedure minimizes aeration of the ground water during sample collection, which improves the sample quality for VOC analysis. Third, in most cases the procedure significantly reduces the volume of ground water purged from a well and the costs associated with its proper treatment and disposal.

III. ADDRESSING POTENTIAL PROBLEMS

Problems that may be encountered using this technique include a) difficulty in sampling wells with insufficient yield; b) failure of one or more key indicator parameters to stabilize; c) cascading of water and/or formation of air bubbles in the tubing; and d) cross-contamination between wells.

Insufficient Yield

Wells with insufficient yield (i.e., low recharge rate of the well) may dewater during purging. Care should be taken to avoid loss of pressure in the tubing line due to dewatering of the well below the level of the pump's intake. Purging should be interrupted before the water level in the well drops below the top of the pump, as this may induce cascading of the sand pack. Pumping the well dry should therefore be avoided to the extent possible in all cases. Sampling should commence as soon as the volume in the well has recovered sufficiently to allow collection of samples. Alternatively, ground water samples may be obtained with techniques designed for the unsaturated zone, such as lysimeters.

Failure to Stabilize Key Indicator Parameters

If one or more key indicator parameters fails to stabilize after 4 hours, one of four options should be considered: a) continue purging in an attempt to achieve stabilization; b) discontinue purging, do not collect samples, and document attempts to reach stabilization in the log book; c) discontinue purging, collect samples, and document attempts to reach stabilization in the log book; or d) Secure the well, purge and collect samples the next day (preferred). The key indicator parameter for samples to be analyzed for VOCs is dissolved oxygen. The key indicator parameter for all other samples is turbidity.

Cascading

To prevent cascading and/or air bubble formation in the tubing, care should be taken to ensure that the flow rate is sufficient to maintain pump suction. Minimize the length and diameter of tubing (i.e., 1/4 or 3/8 inch ID) to ensure that the tubing remains filled with ground water during sampling.

Cross-Contamination

To prevent cross-contamination between wells, it is strongly recommended that dedicated, in-place pumps be used. As an alternative, the potential for cross-contamination can be reduced by performing the more thorough "daily" decontamination procedures between sampling of each well in addition to the start of each sampling day (see Section VII, below).

Equipment Failure

Adequate equipment should be on-hand so that equipment failures do not adversely impact sampling activities.

IV. PLANNING DOCUMENTATION AND EQUIPMENT

- Approved site-specific Field Sampling Plan/Quality Assurance Project Plan (QAPP). This plan must specify the type of pump and other equipment to be used. The QAPP must also specify the depth to which the pump intake should be lowered in each well. Generally, the target depth will correspond to the mid-point of the most permeable zone in the screened interval. Borehole geologic and geophysical logs can be used to help select the most permeable zone. However, in some cases, other criteria may be used to select the target depth for the pump intake. In all cases, the target depth must be approved by the EPA hydrogeologist or EPA project scientist.

- Well construction data, location map, field data from last sampling event.

- Polyethylene sheeting.

- Flame Ionization Detector (FID) and Photo Ionization Detector (PID).

- Adjustable rate, positive displacement ground water sampling pump (e.g., centrifugal or bladder pumps constructed of stainless steel or Teflon). A peristaltic pump may only be used for inorganic sample collection.

- Interface probe or equivalent device for determining the presence or absence of NAPL.

- Teflon or Teflon-lined polyethylene tubing to collect samples for organic analysis. Teflon or Teflon-lined polyethylene, PVC, Tygon or polyethylene tubing to collect samples for inorganic analysis. Sufficient tubing of the appropriate material must be available so that each well has dedicated tubing.

- Water level measuring device, minimum 0.01 foot accuracy, (electronic preferred for tracking water level drawdown during all pumping operations).

- Flow measurement supplies (e.g., graduated cylinder and stop watch or in-line flow meter).

- Power source (generator, nitrogen tank, etc.).
- Monitoring instruments for indicator parameters. Eh and dissolved oxygen must be monitored in-line using an instrument with a continuous readout display. Specific conductance, pH, and temperature may be monitored either in-line or using separate probes. A nephalometer is used to measure turbidity.

- Decontamination supplies (see Section VII, below).

- Logbook (see Section VIII, below).

- Sample bottles.

- Sample preservation supplies (as required by the analytical methods).

- Sample tags or labels, chain of custody.

V. SAMPLING PROCEDURES

Pre-Sampling Activities

1. Start at the well known or believed to have the least contaminated ground water and proceed systematically to the well with the most contaminated ground water. Check the well, the lock, and the locking cap for damage or evidence of tampering. Record observations.

2. Lay out sheet of polyethylene for placement of monitoring and sampling equipment.

3. Measure VOCs at the rim of the unopened well with a PID and FID instrument and record the reading in the field log book.

4. Remove well cap.

5. Measure VOCs at the rim of the opened well with a PID and an FID instrument and record the reading in the field log book.

6. If the well casing does not have a reference point (usually a V-cut or indelible mark in the well casing), make one. Note that the reference point should be surveyed for correction of ground water elevations to the mean geodesic datum (MSL).

7. Measure and record the depth to water (to 0.01 ft) in all wells to be sampled prior to purging. Care should be taken to minimize disturbance in the water column and dislodging of any particulate matter attached to the sides or settled at the bottom of the well.

8. If desired, measure and record the depth of any NAPLs using an interface probe. Care should be taken to minimize disturbance of any sediment that has accumulated at the bottom of the well. Record the observations in the log book. If LNAPLs and/or DNAPLs are detected, install the pump at this time, as described in step 9, below. Allow the well to sit for several days between the measurement or sampling of any DNAPLs and the low-stress purging and sampling of the ground water.

Sampling Procedures

9. Install Pump: Slowly lower the pump, safety cable, tubing and electrical lines into the well to the depth specified for that well in the EPA-approved QAPP or a depth otherwise approved by the EPA hydrogeologist or EPA project scientist. The pump intake must be kept at least two (2) feet above the bottom of the well

to prevent disturbance and resuspension of any sediment or NAPL present in the bottom of the well. Record the depth to which the pump is lowered.

10. Measure Water Level: Before starting the pump, measure the water level again with the pump in the well. Leave the water level measuring device in the well.

11. Purge Well: Start pumping the well at 200 to 500 milliliters per minute (ml/min). The water level should be monitored approximately every five minutes. Ideally, a steady flow rate should be maintained that results in a stabilized water level (drawdown of 0.3 ft or less). Pumping rates should, if needed, be reduced to the minimum capabilities of the pump to ensure stabilization of the water level. As noted above, care should be taken to maintain pump suction and to avoid entrainment of air in the tubing. Record each adjustment made to the pumping rate and the water level measured immediately after each adjustment.

12. Monitor Indicator Parameters: During purging of the well, monitor and record the field indicator parameters (turbidity, temperature, specific conductance, pH, Eh, and DO) approximately every five minutes. The well is considered stabilized and ready for sample collection when the indicator parameters have stabilized for three consecutive readings as follows (Puls and Barcelona, 1996):

    ±0.1 for pH
    ±3% for specific conductance (conductivity)
    ±10 mv for redox potential
    ±10% for DO and turbidity

    Dissolved oxygen and turbidity usually require the longest time to achieve stabilization. The pump must not be removed from the well between purging and sampling.

13. Collect Samples: Collect samples at a flow rate between 100 and 250 ml/min and such that drawdown of the water level within the well does not exceed the maximum allowable drawdown of 0.3 ft. VOC samples must be collected first and directly into sample containers. All sample containers should be filled with minimal turbulence by allowing the ground water to flow from the tubing gently down the inside of the container.

Ground water samples to be analyzed for volatile organic compounds (VOCs) require pH adjustment. The appropriate EPA Program Guidance should be consulted to determine whether pH adjustment is necessary. If pH adjustment is necessary for VOC sample preservation, the amount of acid to be added to each sample vial prior to sampling should be determined, drop by drop, on a separate and equal volume of water (e.g., 40 ml). Ground water purged from the well prior to sampling can be used for this purpose.

14. Remove Pump and Tubing: After collection of the samples, the tubing, unless permanently installed, must be properly discarded or dedicated to the well for resampling by hanging the tubing inside the well.

15. Measure and record well depth.

16. Close and lock the well.

VI. FIELD QUALITY CONTROL SAMPLES

Quality control samples must be collected to determine if sample collection and handling procedures have adversely affected the quality of the ground water samples. The appropriate EPA Program Guidance should be consulted in preparing the field QC sample requirements of the site-specific QAPP.

All field quality control samples must be prepared exactly as regular investigation samples with regard to sample volume, containers, and preservation. The following quality control samples should be collected during the sampling event:

- Field duplicates
- Trip blanks for VOCs only
- Equipment blank (not necessary if equipment is dedicated to the well)

As noted above, ground water samples should be collected systematically from wells with the lowest level of contamination through to wells with highest level of contamination. The equipment blank should be collected after sampling from the most contaminated well.

VII. DECONTAMINATION

Non-disposable sampling equipment, including the pump and support cable and electrical wires which contact the sample, must be decontaminated thoroughly each day before use ("daily decon") and after each well is sampled ("between-well decon"). Dedicated, in-place pumps and tubing must be thoroughly decontaminated using "daily decon" procedures (see #17, below) prior to their initial use. For centrifugal pumps, it is strongly recommended that non-disposable sampling equipment, including the pump and support cable and electrical wires in contact with the sample, be decontaminated thoroughly each day before use ("daily decon").

EPA's field experience indicates that the life of centrifugal pumps may be extended by removing entrained grit. This also permits inspection and replacement of the cooling water in centrifugal pumps. All non-dedicated sampling equipment (pumps, tubing, etc.) must be decontaminated after each well is sampled ("between-well decon," see #18 below).

17. **Daily Decon**

A) Pre-rinse: Operate pump in a deep basin containing 8 to 10 gallons of potable water for 5 minutes and flush other equipment with potable water for 5 minutes.

B) Wash: Operate pump in a deep basin containing 8 to 10 gallons of a non-phosphate detergent solution, such as Alconox, for 5 minutes and flush other equipment with fresh detergent solution for 5 minutes. Use the detergent sparingly.

C) Rinse: Operate pump in a deep basin of potable water for 5 minutes and flush other equipment with potable water for 5 minutes.

D) Disassemble pump.

E) Wash pump parts: Place the disassembled parts of the pump into a deep basin containing 8 to 10 gallons of non-phosphate detergent solution. Scrub all pump parts with a test tube brush.

F) Rinse pump parts with potable water.

G) Rinse the following pump parts with distilled/ deionized water: inlet screen, the shaft, the suction interconnector, the motor lead assembly, and the stator housing.

H) Place impeller assembly in a large glass beaker and rinse with 1% nitric acid (HNO_3).

I) Rinse impeller assembly with potable water.

J) Place impeller assembly in a large glass bleaker and rinse with isopropanol.

K) Rinse impeller assembly with distilled/deionized water.

18. **Between-Well Decon**

A) Pre-rinse: Operate pump in a deep basin containing 8 to 10 gallons of potable water for 5 minutes and flush other equipment with potable water for 5 minutes.

B) Wash: Operate pump in a deep basin containing 8 to 10 gallons of a non-phosphate detergent solution, such as Alconox, for 5 minutes and flush other equipment with fresh detergent solution for 5 minutes. Use the detergent sparingly.

C) Rinse: Operate pump in a deep basin of potable water for 5 minutes and flush other equipment with potable water for 5 minutes.

D) Final Rinse: Operate pump in a deep basin of distilled/deionized water to pump out 1 to 2 gallons of this final rinse water.

VIII. FIELD LOG BOOK

A field log book must be kept each time ground water monitoring activities are conducted in the field. The field log book should document the following:

- Well identification number and physical condition.
- Well depth, and measurement technique.
- Static water level depth, date, time, and measurement technique.
- Presence and thickness of immiscible liquid layers and detection method.

- Collection method for immiscible liquid layers.
- Pumping rate, drawdown, indicator parameters values, and clock time, at three to five minute intervals; calculate or measure total volume pumped.
- Well sampling sequence and time of sample collection.
- Types of sample bottles used and sample identification numbers.
- Preservatives used.
- Parameters requested for analysis.
- Field observations of sampling event.
- Name of sample collector(s).
- Weather conditions.
- QA/QC data for field instruments.

IX. REFERENCES

Cohen, R.M. and J.W. Mercer, 1993, DNAPL Site Evaluation, C.K. Smoley Press, Boca Raton, Florida.

Puls, R.W. and M.J. Barcelona, 1996, Low-Flow (Minimal Drawdown) Groundwater Sampling Procedures, EPA/540/S-95/504.

U.S. EPA, 1993, RCRA Ground-Water Monitoring: Draft Technical Guidance, EPA/530-R-93-001.

U.S. EPA Region II, 1989, CERCLA Quality Assurance Manual.

DRAFT

Procedures For Collecting Samples When Using En Core™ Samplers for Analysis Through the USEPA Contract Laboratory Program(CLP)

EQUIPMENT

- En Core™ Samplers (5g).
- 60ml wide mouth soil sample containers for dry weight.
- T-handle.
- Stainless steel spoon or spatula.
- Paper towels.

SAMPLING PROCEDURES

1. Collect three En Core™ samples and one percent moisture sample (60ml wide mouth glass container with no head space) for each sample point location.

2. Remove the sampler and cap from the En Core™ package and attach the T-handle to the sampler body.

3. Quickly push the sampler into a freshly exposed surface of soil (ground surface or soil core sampler) until the sampler is full.

4. Check to see whether the sampler is full by looking into the viewing hole in the T-handle. The back o-ring on the plunger will show in the viewing window when soil has fully pushed the plunger back. The plunger can only be rotated when it is completely pushed to the back of the sampler body. If the plunger can be twisted, this indicates that soil has completely filled the sampler and the back o-rings have sealed.

5. Scrape any excess soil flush with the edge of the sampler using a dedicated or decontaminated stainless steel trowel.

6. Use a paper towel to quickly and carefully wipe the sampler head so that the cap can be tightly attached and sealed.

7. To attach the cap, push the cap on with a twisting motion. The cap is properly sealed when the two locking arms are completely seated over the ridge on the body of the sampler.

8. Complete the sample label on the En Core™ zipper lock package.

9. Fill in the sample identification number (i.e. CLP number,) on the self adhesive label attached beneath the sample label on the En Core™ package.

10. Tear the self adhesive label at the perforation and attach the label to the rim of the sampler cap.

11. Place the sampler back into the En Core™ zipper lock package and seal the zipper lock. The CLP Sample label may be used as a custody seal to be placed over the opening of the En Core™ zipper lock package to ensure sample integrity. If the CLP label is not used as a custody seal, the CLP sample label must be attached to the exterior of the En Core™ package and a custody seal place over the opening of the package.

12. Repeat the procedure above for the other two samplers.

13. Once all three samplers have been filled, labeled and packaged, place the three En Core™ packages into one large zipper lock bag with a completed sample tag. Sample tags are required by the CLP, unless waived by the Regional Sample Control Coordinator (RSCC).

14. Collect the percent moisture sample in a separate sample container (60ml wide mouth glass container).

15. Double volume is required for the collection of the MS/MSD samples. This includes six En Core™ samplers and one 60ml wide mouth glass container.

16. Store all samples in a cooler with bagged ice to maintain 4 degrees Celsius while storing on site and during shipment to the laboratory.

17. Samples must be shipped off site to the laboratory within 24 hours.

18. Samples must be received by the laboratory for preservation and preparation for extraction with in 2 days from the date of sample collection.

Note: The En Core sampler can not be used in the normal manner when sampling non-cohesive/unconsolidated soils (e.g., sands). When sampling sandy soils, the procedure to be used in place of step 3 above is as follows:

3. Manually pull back the plunger to form the seal on the back of the sampler body. Use a dedicated or decontaminated stainless steel trowel or spatula as a rigid structure to push the soil into the sampler. The soil should be packed tight to completely fill the sampler. Proceed through the remaining steps.

Figure 1 - En Core™ Sampler and Zipper Lock Package

Zipper lock package

Plunger with o-ring

Ridge

Sampler body

Sampler cap with locking arms

Self adhesive label